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Fee-for-Service/Managed Care Differences in Health Scores Adjusting for Demographic Mix

In this section, we return to comparison of the entire Medicare FFS and MCO populations, as in Section 3.1. But we use multiple regression analysis to simultaneously control for multiple demographic characteristics when comparing FFS and MCO enrollees' health status. This differs from the descriptive analyses in Section 3.1 when at most a single demographic characteristic (e.g., age) was held constant for a comparison. We limit our comparison in this section to FFS/MCO differences in the summary SF-36 physical and mental health scores, PCS and MCS, respectively.

4.1 Methods

Tables 15 and 16 present the multiple regression results. The PCS is the dependent variable in Table 15; in Table 16, the MCS is the dependent variable. The sample is the union of the FFS national sample and the entire MCO sample, weighted to reflect plan enrollment. Thus, the results should be representative of the national Medicare FFS and MCO enrollee populations as of 1997.

Each analysis begins with an unadjusted difference of FFS from managed care (Model 1 of Tables 15 and 16). The difference is captured by the coefficient of a binary variable that takes the value '1' when an observation (beneficiary) is from the FFS national sample. The intercept coefficient in Model 1 reflects the mean MCO PCS or MCS score. The FFS mean score is given by the sum of the coefficients of the intercept and the FFS binary variable.

Table 15

**Nationally Representative Fee -for-Service/Managed Care Difference in Physical
Component Score Controlling for Demographic Factors**

	<u>1</u>		<u>2</u>		<u>3</u>	
	<u>Unadjusted Difference</u>		<u>Control for Age/Sex</u>		<u>Control for Age/ Sex & Other Demographics</u>	
Number of Observations:	169,539		169,539		169,539	
R-Square	0.0001		0.0995		0.1500	
Adjusted R-Square	0.0001		0.0995		0.1499	
Dependent Variable Mean:	38.16		38.16		38.16	
Root Mean Square Error:	0.7448		0.7069		0.6868	
Model Parameters	2		11		15	
Computer Output:	RUN040.LST		RUN040.LST		RUN040.LST	
<u>Label</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>
Intercept	40.64	54.57	42.27	59.68	43.06	62.55
FFS Difference from Managed Care	-2.49	-3.34	-1.53	-2.17	-0.88	-1.28
<u>Age/Sex</u>						
Male, 0-54	--	--	-7.33	-44.64	-5.37	-33.09
Male, 55-64	--	--	-6.72	-37.26	-7.44	-42.34
Male, 65-74	--	--	2.12	23.68	1.64	18.78
Male, 75-84	--	--	-3.26	-33.73	-4.31	-45.69
Male, 85+	--	--	-6.29	-41.39	-7.10	-47.98
Female, 0-54	--	--	-8.56	-48.70	-5.92	-34.01
Female, 55-64	--	--	-17.80	-73.53	-18.55	-78.79
Female, 75-84	--	--	-2.58	-31.03	-3.14	-38.79
Female, 85+	--	--	-9.00	-79.68	-9.05	-82.16
<u>Other Demographics</u>						
Medicaid	--	--	--	--	-7.13	-77.76
Originally Disabled	--	--	--	--	-16.08	-51.41
Black	--	--	--	--	-2.55	-23.16
Other Race	--	--	--	--	1.04	7.23

NOTE:

Female, 65-74 is the omitted age/sex category in Models 2 and 3, which is captured in the intercept.

FFS national sample, weighted MCO data.

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 16

**Nationally Representative Fee -for-Service/Managed Care Difference in Mental
Component Score Controlling for Demographic Factors**

	<u>1</u>		<u>2</u>		<u>3</u>	
	<u>Unadjusted Difference</u>		<u>Control for Age/Sex</u>		<u>Control for Age/ Sex & Other Demographics</u>	
Number of Observations:	169,539		169,539		169,539	
R-Square	0.0001		0.1295		0.1701	
Adjusted R-Square	0.0001		0.1294		0.1700	
Dependent Variable Mean:	48.94		48.94		48.94	
Root Mean Square Error:	0.7015		0.6546		0.6391	
Model Parameters	2		11		15	
Computer Output:	RUN040.LST		RUN040.LST		RUN040.LST	
<u>Label</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>
Intercept	51.84	73.90	52.80	80.49	53.75	83.9
FFS Difference from Managed Care	-2.90	-4.14	-2.00	-3.06	-1.60	-2.50
<u>Age/Sex</u>						
Male, 0-54	--	--	-11.53	-75.85	-9.83	-65.08
Male, 55-64	--	--	-12.66	-75.79	-12.95	-79.20
Male, 65-74	--	--	1.44	17.42	0.93	11.43
Male, 75-84	--	--	-1.55	-17.40	-2.44	-27.78
Male, 85+	--	--	-1.77	-12.54	-2.43	-17.64
Female, 0-54	--	--	-14.02	-86.13	-11.77	-72.62
Female, 55-64	--	--	-17.46	-77.90	-17.81	-81.27
Female, 75-84	--	--	-0.66	-8.55	-1.16	-15.36
Female, 85+	--	--	-3.36	-32.16	-3.58	-34.92
<u>Other Demographics</u>						
Medicaid	--	--	--	--	-5.71	-66.97
Originally Disabled	--	--	--	--	-7.13	24.50
Black	--	--	--	--	-2.53	24.70
Other Race	--	--	--	--	-3.29	24.60

NOTE: Female, 65-74 is the omitted age/sex category in Models 2 and 3, which is captured in the intercept.

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

In the second model in Tables 15 and 16, a vector of age/sex cells is added to the regression explanatory variables to control for age/sex mix differences between the FFS and MCO populations. The category "female, 65-74" is omitted to avoid perfect collinearity in the regression. The intercept coefficient now measures the mean PCS or MCS of females, age 65-74 who are enrolled in managed care. All the other age/sex coefficients measure PCS or MCS relative to the intercept term. For example, the coefficient for "male, 0-54" must be added to the intercept coefficient to obtain the mean PCS or MCS for males age 0-54 enrolled in managed care. The coefficient of the FFS binary variable reflects the average FFS difference from managed care, holding constant age/sex mix.

Model 3 in Tables 15 and 16 adds three demographic factors to the explanatory variables: poverty status (Medicaid enrollment), aged originally entitled by disability, and race (divided into white, black, and other race). The omitted categories reflected in the coefficient of the intercept are: not enrolled in Medicaid, not originally disabled, white race, and female, age 65-74. The coefficient of the FFS binary variable now reflects the average FFS difference from managed care holding constant age, sex, and the additional three demographic factors¹.

Other factors could be held constant when comparing FFS to managed care. We limited ourselves to holding constant the demographic variables shown in Tables 15 and

¹ Most of the beneficiaries on which the age/sex and other demographic effects are estimated are enrolled in managed care because the sample size of the MCO HOS is much larger than the sample size of the FFS HOS. Therefore, the demographic effects primarily reflect relationships in the MCO population. We estimated the Model 3 regressions in Tables 15 and 16 separately on FFS and MCO samples and found that the relationship of the demographic variables to the PCS and MCS was similar in the two populations.

16 for a few reasons. First, our comparisons are intended as an initial exploratory analysis, not an exhaustive analysis of all possible comparisons that could be analyzed in future work. Second, all the demographic factors analyzed in this section are available for all Medicare enrollees (FFS or managed care) from HCFA administrative files. Other factors, such as education and income, are available only from surveys such as the HOS for a small subset of Medicare beneficiaries, which may limit their general usefulness in making comparisons and adjustments. Third, survey-derived variables such as education and income suffer from substantial item nonresponse. This missing data would reduce our sample sizes and might limit the validity of our regression estimates. Fourth, all the variables that we utilize, with the exception of race, are currently used to adjust HCFA Medicare capitation payments for Medicare + Choice organizations. Controlling for these variables may provide some evidence about health status selection bias between managed care and FFS holding constant payment adjusters.

4.2 Results

Model 1 of Table 15 shows that the unadjusted FFS/MCO difference in PCS is negative 2.49 points, that is, the average PCS among FFS enrollees is 2.5 points lower than among MCO enrollees. This is the same finding as in Table 4 (the 2.4 instead of 2.5 difference in Table 4 in FFS versus MCO PCS is due to rounding). This difference, while small, is both statistically and clinically significant.

When age/sex mix is held constant in Model 2, the FFS difference from managed care falls (in absolute value) to negative 1.53 points. While still statistically significant,

this difference falls below our threshold of 2 points and is no longer considered clinically significant. To repeat, we do not find a clinically significant difference in physical health as measured by the PCS between Medicare FFS and managed care enrollees when we hold constant their age/sex mix. Controlling for age/sex mix "explains" (accounts for) 39% of the unadjusted FFS/MCO difference ($1-(1.53/2.49)=0.39$).

In Model 3, in addition to age and sex, we control for Medicaid enrollment (poverty status), originally disabled, and race. With these three variables entered, the FFS difference from managed care is reduced to negative 0.88 points. This difference is neither statistically nor clinically significant. The three additional demographic factors explain an additional 26% of the original FFS difference from managed care. Altogether, the demographic factors in Model 3 account for 65%, or about two-thirds, of the FFS/MCO difference in PCS ($1-(0.88/2.49)=0.65$).

The pattern is much the same for the MCS, as shown in Table 16. The unadjusted difference is 2.90 points, with FFS enrollees having lower mental health status. This difference is statistically and clinically significant, although relatively small. When age/sex mix is held constant (Model 2), the difference falls to 2.00 points, and remains statistically significant. When the additional demographic factors are added, the difference falls to 1.60 points and remains statistically significant, although it is no longer clinically important. Age/sex alone explains 31% ($1-2/2.9=0.31$) of FFS/MCO MCS differences, and all demographic factors simultaneously explain 45% ($1-1.6/2.9=0.45$) of the difference. Hence, a somewhat smaller percentage of mental health than physical health differences are explained by demographic factors.

The pattern of demographic coefficients in Tables 15 and 16 is plausible. As shown in Model 3 of Table 15, the under-age-65 disabled have poorer physical health status than the younger elderly. Disabled females aged 55 to 64 report particularly poor physical health status. As expected, the older elderly also report poorer physical health status than the younger elderly. Men seem to report slightly better physical health than women in most age ranges, but differences by sex are not pronounced. Blacks and Medicaid enrollees have poorer health status than whites and non-dual eligibles, respectively. The originally disabled report particularly poor physical health status, holding other factors constant.

Model 3 of Table 16 shows that the under-age-65 disabled report considerably poorer mental health than the younger elderly. This is not surprising since many of the disabled have mental disabilities, and all are not able to work. Reported mental health is only slightly worse among the older elderly than the younger elderly. Perceptions of well being seem to decline more slowly with age than physical health. Women report slightly worse mental health than men at most age ranges, but the differences by sex are again small. Medicaid enrollees, the originally disabled, and nonwhites all report poorer mental health.